Adm.

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Mr. Dennis R. Chastain
United States General Accounting Office
Washington, D.C.   20548

Dear Dennis:

I have attached an expansion of computer measure-
ment problems as I see it. For any further information,
please feel free to call me.

Sincerely,

Director,
DD/S&T Career Development Course #7

Attachments:
a/s above

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If one spends a period of time in computer measurement and analysis, he will find that there are a number of weaknesses or gaps in today's systems. Of course we would like to see these deficiencies eliminated or improved upon in the upcoming systems. Although I will limit my discussion to the IBM Systems, the points outlined will pertain to both the time-sharing and batch concepts. I will limit the following to four main points:

1. **Definition of the parameters that must be used to measure and model computer systems.**
One quickly finds in computer system measurement that many key parameters that one would like to examine are not available. For example, a main objective is to understand the system control of resources – both the availability and the utilization. In OS/MVT, one can measure core utilization accurately; one cannot measure CPU or I/O utilization precisely. In CP/67, all three utilizations cannot be measured accurately. There are many other parameters beyond system utilization that one would like to understand; various queues lengths, service times, and waiting times are just some. One will find that the reason why many of these parameters are impossible to obtain is because at system conception and design, little time and energy was devoted to user measurement.

2. **A facility to understand the interrelationships of the system parameters easily.**
If we are truly going to believe that we are going to deal with a system, one must be able to place the system in his environment, measure the parameters and truly understand the interrelationships of these variables. Through the understanding of these variables, one should be able to describe the system profile and modify the system as needed.

3. **A comprehensive understanding of the dispatching, scheduling process in the form of management of resources.**
One can explore specifically why he wants to change his system. He quickly finds out that it is not because he cannot physically perform the function on his present system. Generally, he wants to change because of time constraints. However, little is known today in how resources are scheduled to be used. If one contrasts OS/360 with CP/67 in this area, he will find more unknowns in the CP/67 scheduling process and resource management. Very little is known about the two queues in CP/67 or how they should be adjusted. With respect to a work load, very little is known about how the work load exists within the CP states (state 1, 2, 3, 4). I believe it is mandatory that we

understand the control mechanism of the system resources.
If one were to look at the CP PLM, one would find that
parameter definitions have been made rather arbitrary.
Of course, beyond the understanding of the control mecha-
nism, one would like the system to dynamically change this
mechanism to service the work stream.

4. A cyclic process for system improvement.
    I believe that the manufacture-user relationship
must be upgraded to define and implement a defined orderly
process for system improvement. Both user and manufacturer
must measure a particular installation's system accurately.
A decision must be summarized in a more scientific way
as to whether to modify, delete or add to the system.
More precisely, the government user must be able to have
measurement tools or systems to accurately estimate the
performance of his job environment within different
alternatives. All too often the user cannot exercise
alternatives in a realistic way to arrive at intelligent
decisions. While I recognize that this would be a
considerable amount of work. I believe that it would be
extremely helpful in the computing environment in which we
live. Today industry and government do not usually buy
a totally new computing system for an entirely new work
stream; in most cases, they upgrade and add on to what they
have. Thus one should be able to:
    a. measure his own computer system environment
    b. with respect to this environment, model or
       demonstrate a number of solutions and
       associated trade-offs.
    c. verify the results when the decision is made.